

03-19-2001  
1999P03224WO  
PCT/DE 00/00837

09/937913  
PCT Rec'd 01 OCT 2001  
DE 000000837

Description

Master control system for a rolling mill, especially for a mill train

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The invention relates to a master control system for a rolling mill, especially a mill train, the rolling mill, especially the mill train, having at least one rolling stand driven by means of a drive system, and the master control system having an automation device for the open-loop and/or closed-loop control of the rolling stand, and also relates to a method of operating a rolling mill, especially a mill train, having a master control system of this type.

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It is customary for the commissioning of individual components of a rolling mill or a mill train to connect said components by a data link to a commissioning computer and to commission them by transferring a program code or operating parameters. After completion of this process, this operation is repeated with the next system component. System components in this sense may be, for example, drive systems or automation devices. When individual components, for example defective components, are exchanged, the new component, for example a new automation device or a new drive system, is also correspondingly commissioned.

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The object is to improve the commissioning.

The object is achieved according to the invention by a master control system as claimed in claim 1, a rolling

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mill, especially a mill train, as claimed in claim 9 and a  
method as claimed in claim 10. For a rolling mill,  
especially a mill train, which has at least one rolling  
stand driven by means of a drive system and a master  
5 control system with at least one automation device for the  
open-loop and/or closed-loop control of the rolling stand,  
it is provided here that the master control system has a  
commissioning computer for the commissioning of the drive  
system and of the automation device. According to the

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method as claimed by the invention, the commissioning of the drive system and of the automation device takes place by means of the commissioning computer. The master control system has at least one bus system for the transmission of operating parameters and/or program code from the commissioning computer to at least one of the components comprising the drive system and automation device. Furthermore, the bus system is designed for the transmission of information necessary for the operation of the rolling mill, especially the mill train, between the drive system and the automation device.

In an advantageous refinement of the invention, the master control system has an operator-control computer for monitoring and/or influencing the rolling mill, especially the mill train, the commissioning computer being designed for the commissioning of the operator-control computer.

In an especially advantageous refinement of the invention, the bus system is designed for the transmission of operating parameters and/or program code from the commissioning computer to the operator-control computer.

In an especially advantageous refinement of the invention, the bus system is designed for the transmission of information necessary for the operation of the rolling mill, especially the mill train, between the operator-control computer and at least one of the components comprising the drive system and the automation device.

In a further advantageous refinement of the invention, the master control system has at least one first bus system

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- for the transmission of operating parameters and/or program code from the commissioning computer to the automation device, connecting the commissioning computer and the automation device by a data link, and has at least
- 5 one second bus system for the transmission of operating parameters and/or program code to the drive system, connecting the automation device and the drive system by a data link.
- 10 In a further advantageous refinement of the invention, the second bus system is designed for the transmission of information necessary for the operation of the rolling mill, especially the mill train, between the automation device and the drive system.

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In a further advantageous refinement of the invention, the master control system has an operator-control computer for monitoring and/or influencing the rolling mill, especially the mill train, the operator-control computer being  
5 connected to the first bus system by a data link, and the first bus system being designed for the transmission of information necessary for the operation of the rolling mill, especially the mill train, between the operator-control computer and the automation device.

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In a further advantageous refinement of the invention, the master control system has at least two automation devices of different types, the commissioning computer being designed for the commissioning of both automation devices.

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Further advantages and details emerge from the following description of an exemplary embodiment.

The figure shows a master control system in an exemplary  
20 configuration. Provided here is an industrial Ethernet bus 9, which connects two identically or differently designed automation devices 5 and 6, an operator-control computer 4 and a commissioning computer 1 to one another by a data link. The industrial Ethernet bus 9 is  
25 connected to a standard Ethernet bus 8 via a computer 7. Connected to the standard Ethernet bus 8 are an operator-control computer 2 and a central operator-control computer 3. Parts of the rolling mill or parts of the mill train can be operated via the operator-control computers 2 and  
30 4. The interaction of individual system parts of the rolling mill or the mill train can be operated by means of the central operator-control computer 3. Various

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actuators or sensors 12, 13, 14, 15 are connected by a data link to the automation device 5 via a bus system 23, which is designed as a Profibus. Furthermore, decentralized peripherals 10 are connected to the  
5 automation device 5 via the bus system 23. Various actuators or sensors 16, 17, 18, 19 are connected by a data link to the

designed as a Profibus. Furthermore, decentralized peripherals 11 are connected to the automation device 6 via the bus system 24.

- 5 Various actuators and sensors 20, 21, 22 can be activated and evaluated via the decentralized peripherals 11 and the automation device 6.

10 The operator-control computers 2, 3, 4, the automation devices 5, 6, the decentralized peripherals 10, 11, the actuators and sensors 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22 and the bus systems 8, 9, 23, 24 serve for the operation of the rolling mill or the mill train. Furthermore, information necessary for the commissioning, 15 such as operating parameters or program codes, that is software, are transmitted from the commissioning computer 1 to the automation devices 5, 6, the decentralized peripherals 10 and 11 and to the actuators and sensors 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22 and, if 20 appropriate, to the operator-control computers 2, 3, 4. The transmission of the commissioning information takes place via the corresponding bus systems 8, 9, 23 and 24.

25 Furthermore, it may also be provided that the commissioning computer 1 is used for the development of the master control system.

30 It is advantageous to provide that diagnostic information on the operating capability of the automation devices 5, 6 of the decentralized peripherals 10, 11 of the actuators and sensors 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22 and, if appropriate, of the operator-control computers 2 and 4 are transmitted to the operator-control computers 2, 3 and 4.

The sensors and actuators 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22 serve by way of example for the open-loop and closed-loop control of drive systems for rolling stands, of cooling sections, of coilers or loop lifters.